

USING DRONES TO MEASURE TREE DENSITY: PROS & CONS



Neal Bolton
Blue Ridge Services

How Much Money?

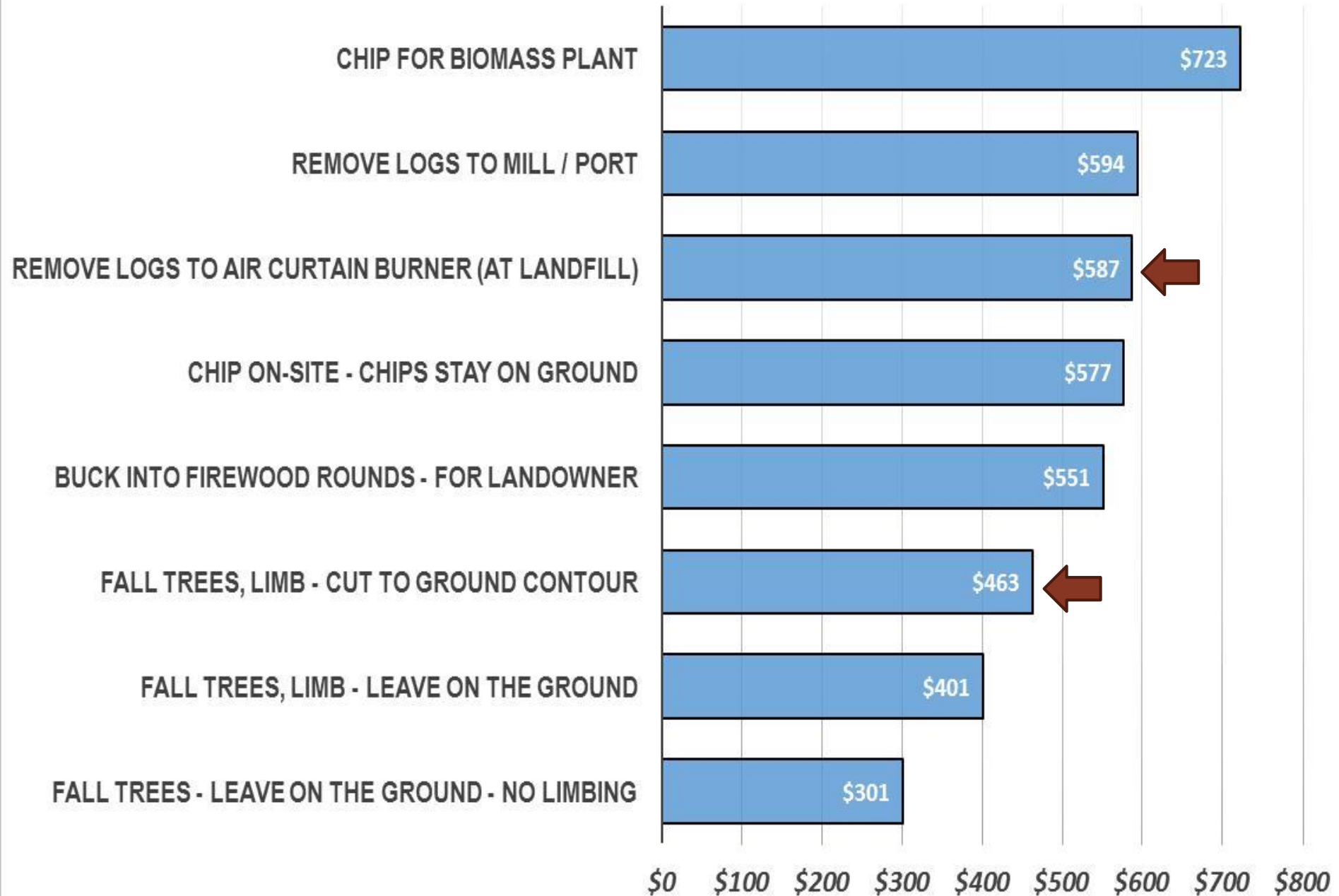


∞ The big question is:

How much will it cost to mitigate the hazard of dead trees?

We are projecting ...(see next slide)

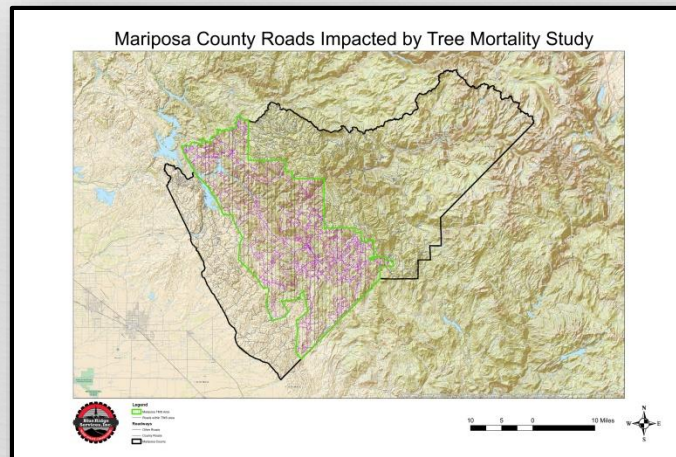
Relative Cost per Tree



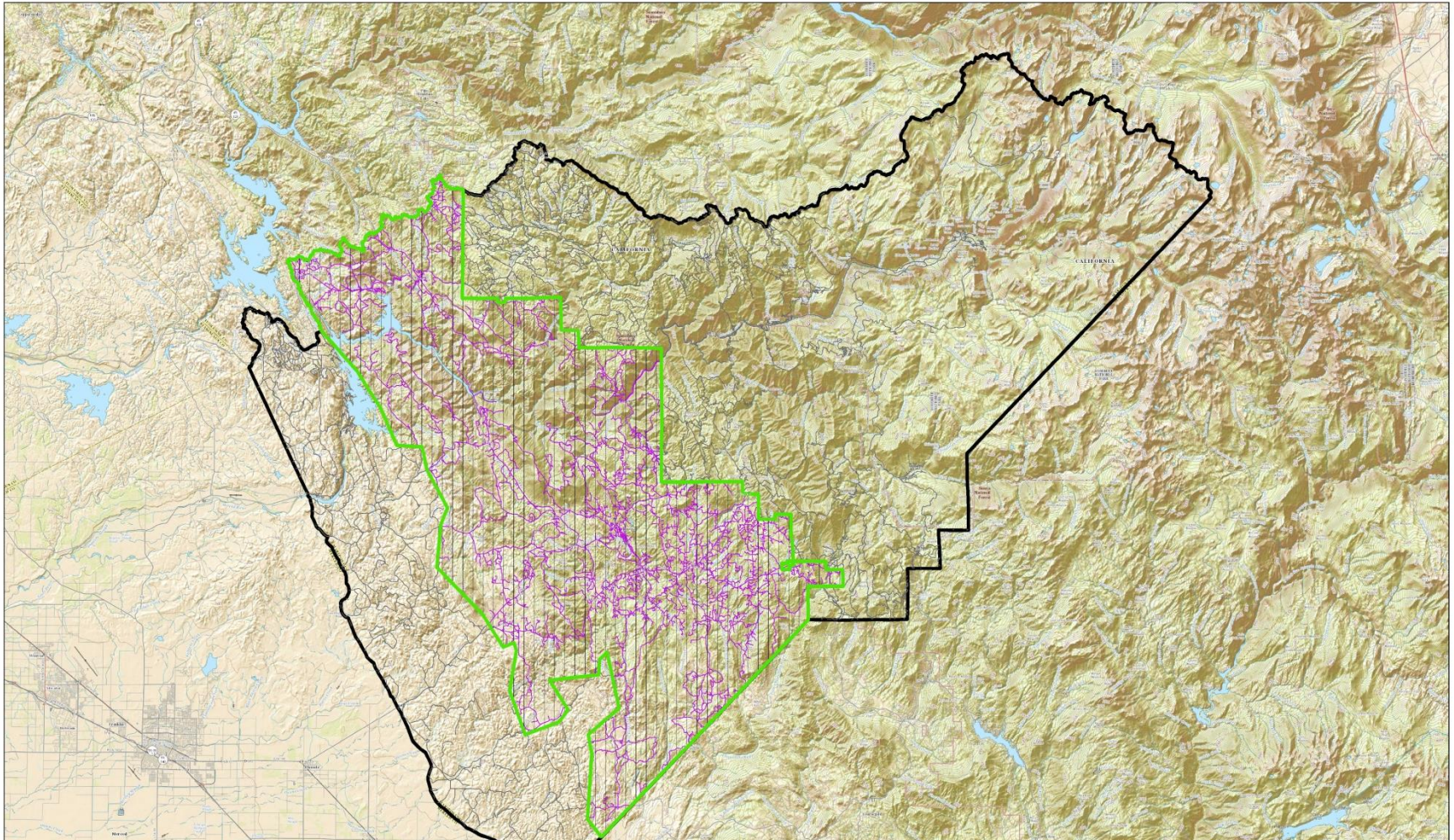
How Many Trees?



❧ We have an estimated cost ...but how many trees are we talking about?



Mariposa County Roads Impacted by Tree Mortality Study



How Many Trees? ...How Much Money?



Legend

- Mariposa TMS Area
- Roads within TMS area

Roadways

- Other Roads
- County Roads
- Mariposa County

10 5 0 10 Miles



Different Counts



- ❧ We are conducting 2 separate Tree Counts
 - ❧ Preliminary count to prepare a broad understanding of scope and estimated cost. We will use this information – along with our hazard matrix – to plan and budget individual projects.
 - ❧ Detailed count – overseen by Forester - just prior to bidding individual projects

Drones: Unmanned Aerial Vehicles (UAVs)



- ❧ There are different types of drones
 - ❧ Multi-Rotor
 - ❧ Fixed Wing
- ❧ The FAA regulates their use
- ❧ The Pilot in Command (PIC) must be FAA certified

MULTI-ROTOR



Multi-Rotor Drones



- ❧ Ideal for smaller to medium areas
- ❧ Fly lower
- ❧ Fly slower
- ❧ Best for machine production analysis

FIXED WING DRONE



Fixed Wing Drone



- ❧ Ideal for very large areas
- ❧ Fly higher
- ❧ Fly faster
- ❧ More accurate than traditional methods

Drones Are Used For:



- ✧ Mapping (3D point cloud and topo)
- ✧ Activity Monitoring / Time-Motion
- ✧ Vegetation Assessments
- ✧ Thermal Imaging
- ✧ Aerial Photography

Drone Applications



œ We

Benefits of Drones for Counting



✧ There are many benefits of using drones:

1. Generates Aerial Photo
2. Can provide 3D point cloud
3. Can be integrated into GIS system (*land ownership*)
4. Can be linked to GPS location of each tree
5. Can be fast in dense forest
6. Shows current conditions ...as opposed to Google Earth

Google Earth Photo 5/26/2014



© 2016 Google

Google Earth

Drone Photo 4/7/2017



Drawbacks of Drones for Counting



✧ There are also some drawbacks with drones:

1. Single line has some distortion
2. Multiple line (3 minimum) required for 3D
3. Battery life is limited to 15-20 minutes
4. Manual Control works best
5. Elevation change slows the process
6. Difficult to count trees after needles drop
7. Often slower and costlier than tally counter

We Currently Have 5 Drones



- ❧ 1 multi-Rotor with hi-res camera ...for mapping small areas and aerial photo.
- ❧ 1 multi-rotor with infrared camera
- ❧ 2 multi-rotors for operational reviews
- ❧ 1 fixed wing with hi-res camera for mapping large areas & aerial photo...

3 Staff FAA Certified



- ✧ We currently have 3 people who are FAA certified.
- ✧ 3 more in process

Contact Info



neal@blueridgeservices.com

209.742.2398